

## Section 815. LANDSCAPING

**815.01 Description.** This work consists of furnishing and planting trees, shrubs, and other plants.

The Engineer reserves the right to inspect, select, and reject plants at any time through the second year establishment period.

Trees, shrubs, and other plants will be classified as nursery stock.

**815.02 Materials.** Materials shall meet the following requirements.

Topsoil .....	917
Peat Moss .....	917
Compost .....	917
Fertilizer .....	917
Water .....	911
Nursery Stock .....	917
Mulching Materials .....	917
Tree Wrapping Materials .....	917
Balling Material .....	917
Wire .....	917
Hose .....	917
Stakes .....	917

### 815.03 Construction.

- A. **Prepared Soil.** Prepared soil shall consist of a uniform mixture of topsoil, peat moss or compost, and fertilizer. The prepared soil shall be proportioned such that a cubic yard of the prepared soil will contain  $\frac{3}{4}$  cubic yard of topsoil,  $\frac{1}{4}$  cubic yard of peat moss or compost, and chemical fertilizer as specified in subsection 917.10.A.1.

Prepared soil shall be produced by thoroughly mixing the component material prior to final placement

- B. **Site Preparation.** Individual holes shall be centered and excavated at staked plant locations. The planting holes shall be large enough to permit placing a minimum of 18 inches laterally beyond the ends of bare roots or root balls. Root ball shall be set on undisturbed ground at the proper depth. Where special conditions of soil or plant requirements dictate, planting hole sizes shall be subject to reasonable variation.

Excavated material shall be removed from the site at the time the hole is dug and shall be disposed of outside the right-of-way according to subsection 205.03.P. The planting holes shall be backfilled with prepared soil the same day they are dug.

Site preparation shall include repair of ruts and turf damage within the right-of-way resulting from the contractors operation.

- C. **Preparation of Shipments.** A sample of each plant species shall be clearly labeled as to species and variety. All plants shall be balled and burlapped or container grown unless otherwise specified on the plans.

Nursery stock shall be prepared for shipment according to the requirements of the current ANSI Specification Z60.1 and shall be enclosed or covered during transportation to prevent drying.

1. **Balled and Burlapped Stock.** In preparation for spring planting, all balling operations shall be completed prior to "bud break." In preparation for fall planting of deciduous plants, balling operations shall not commence until after the plants have begun to "harden off." All stock shall be dug and packed with care immediately prior to shipment. Plants shall be dug and transported so as to provide and retain a firm ball of earth. The roots shall be carefully protected with wet straw, mulch or other material approved by the Engineer. The root balls shall be adequately protected from rain or sudden changes in the weather. Trees or plants will not be accepted if the balls of earth are loosened or broken.
  2. **Container Grown Stock.** Plants furnished in containers shall have been grown in the container for at least one growing season. Plants, other than ground covers, over-established in the container as evidenced by pot bound root ends, will not be accepted.
  3. **Bare Root Stock.** All bare root stock shall be carefully dug in a manner to prevent injury to, or removal of, fibrous feeder roots. Maintain adequate root moisture while transporting the stock to the planting site.
- D. **Seasonal Limitations.** The planting seasons for deciduous plants shall be between March 1 and May 15 and from October 1 until the prepared soil becomes frozen, except that, when unusual planting conditions exist or when container-grown material is used, these planting seasons may be altered by the Engineer.
- The planting season for evergreen plants shall be between March 1 and June 1.
- E. **Care of Plants Before Planting.** Immediately following delivery and inspection at the project site, all plants with exposed roots shall be heeled in moist soil. All heeled in plants shall be protected and their roots kept moist until planted. The heeling in grounds shall be a well protected, shaded area or a well ventilated enclosure.
- The roots of all planting stock shall be kept moist and protected at all times.
- The trunks and branches of all trees shall be protected from injury. All trees that are injured may be rejected.
- F. **Planting.** Planting consists of furnishing initial plants, all replacement plants and all work required to install the plants. Planting procedures shall not begin until water is available at the project site. All plants shall be watered-in at time of planting. The prepared soil shall be watered-in around the root ball and roots and thoroughly firmed at intervals during the process of backfilling.

Sufficient water shall be used to ensure thorough saturation of the prepared soil placed in the plant hole.

1. **Plants Located On Slopes.** For plants located on slopes, an earth saucer or berm of prepared soil shall be constructed half way around each plant on the down slope side. The saucer or berm of prepared soil shall have an inside diameter equal to that of the planting hole, and a maximum height of 6 inches. Soil shall not spill down-slope more than 18 inches.
2. **Balled Stock.** Plants shall be set plumb. Their depth, after settling, shall be the same as the depth in their original location. The prepared soil shall be carefully watered-in and thoroughly firmed at intervals during backfilling under and around the ball to eliminate air pockets. Care should be exercised to prevent damaging the root ball during the

- tamping operation. When the plant hole has been backfilled and compacted to one-half depth, the burlap and lacing shall be removed from around the trunk and from the upper half of the ball. The backfilling of the hole with prepared soil should then continue to an elevation which, after compaction, is flush with the ground line.
3. **Container Grown Stock.** The stock shall be planted as specified for balled stock, and modified as follows. When plants are furnished in containers, the containers shall be removed at the time of planting.  
  
Handling methods which result in a broken or excessively loosened root and soil ball mass will be reason for rejection of the plant.
  4. **Bare Root Stock.** A maximum of root growth shall be preserved and no root pruning will be permitted, except for broken or damaged roots. Plants shall be set plumb and at a depth equal to the depth in their original location. The exposed roots shall be held firmly in the proper position with the roots spread out.
  5. **Mulching.** After backfilling has been completed, wood chips or shredded bark shall be placed over the plant hole area to a depth of 5 to 6 inches.
- G. **Pruning Branches.** All pruning shall be done by an arborist certified by the International Society of Arboriculture. Pruning shall be completed prior to planting. Pruning paint shall not be used.
1. **Deciduous Trees.** Deciduous trees shall be pruned by removing all dead wood and broken branches. Additional pruning may be required as directed by the Engineer. The height ratio of crown to trunk, after pruning, shall be approximately one-third crown to two-thirds trunk. The primary leader shall not normally be cut back. Branches to be removed shall be cut off flush with the trunk or main branch.
  2. **Deciduous Shrubs.** Deciduous shrubs shall be pruned by removing all dead wood and broken branches, thinning out entire canes where they are too thick, cutting back or removing unsymmetrical branches and sufficient other growth to ensure healthy and symmetrical growth of new wood. Shrubs shall be pruned to form a loose outline conforming to the general shape of the shrub type.
  3. **Evergreen Trees and Shrubs.** Evergreens shall be pruned only to the extent of removing broken or damaged branches.
- H. **Wrapping Deciduous Trees.** Trees shall be wrapped within one week after planting. The trunks shall be carefully wrapped beginning at the base of the trunk just above the roots and below the normal ground line and shall extend upward in a spiral with an overlap of one-half the width of the strip. The portion of the wrapping below the finished grade shall be covered with soil. The paper shall be held securely in place with masking tape in a minimum of five places including the top and bottom of wrapping. Tape shall be overlapped a minimum of four times in each of the five places.
- I. **Finishing and Cleaning Up.** Immediately upon completion of the initial and replacement planting work, the Contractor shall clean up the area of surplus materials and remove/dispose of them off site. The Contractor shall repair and re-establish turf in rutted areas as specified in subsection 816.03, as directed by the Engineer, and completed prior to June 1, so that normal roadside maintenance operations can proceed.

- J. **Watering and Cultivating.** In addition to the watering-in required at the time of planting, the Contractor shall water and cultivate (remove grass and weeds) around each plant a minimum of five times during each of the two growing seasons of the establishment period. The watering shall be done by the probe method. Probes shall be of sufficient length to extend to a depth equal to that of the root ball. Probe shall be one inch or less in diameter and have a closed pointed end with holes in the lower 4 inches. A control valve shall be provided at the probe head for regulating water pressure and volume. Probes shall be inserted adjacent to the root ball in no less than three equally spaced locations around the plant. Pressure shall be adjusted so that little or no run off occurs before the required amount of water has been placed. Each plant shall be watered at the following rates. Approximately 35 gallons shall be used per watering for shade trees; for intermediate plants and evergreen trees approximately 20 gallons shall be used per watering; for shrubs approximately 5 gallons shall be used per watering. All holes remaining in the soil where the probe was inserted shall be immediately closed or filled to protect the plant roots.

During each watering and cultivation, all grass and weeds shall be removed within the mulch ring and trimmed to a height of 3 inches around each plant to 12 inches outside the mulch ring; the Contractor shall also inspect for and remedy any insect infestation or disease damage to the plants and prune out any deadwood.

The watering and cultivating shall be done during each of the following periods: (1) June 1- June 15, (2) June 23 - July 7, (3) July 15 - July 29, (4) August 4 - August 18, and (5) September 5 - September 19. Waterings may be added or deleted by the Engineer as conditions warrant.

During the first and second watering of the second growing season, the water used for each plant shall have a nitrogen added as specified in subsection 917.10.A.2.

No fertilizer shall be applied after July 7.

At the time of first watering of the second growing season, the guying material, wrapping material, identification tags, and inspection tags shall be removed and disposed of off the site. At the time of the final watering the mulch around all the plants shall be replenished to a depth of 5 to 6 inches.

- K. **Bracing and Guying.** Deciduous trees shall be braced or guyed immediately after the wrapping is completed. Evergreen trees and bare-rooted deciduous trees shall be braced or guyed immediately after planting. The minimum number of stakes required for bracing will be as follows.

1. **Bare-Root Stock.** 2 stakes.

2. **Balled Stock.**

a. **Low-Headed Trees.** 1 stake (may be omitted when permitted by the Engineer)

b. **Deciduous Clump Trees.** 2 or 3 stakes.

c. **Deciduous, but not Low-Headed, Trees.**

Caliper over 4 inches. 3 stakes.

Caliper 2 through 4 inches or height 8 feet or more. 2 stakes.

Caliper less than 2 inches or height less than 8 feet. 1 stake.

d. **Evergreen Trees.**

Height over 6 feet. 3 stakes.

Height 6 feet or less. 2 stakes.

One stake shall be located on the westerly side of the plant. Where two stakes are used, they shall be positioned on opposite sides of the trunk and each stake secured to the trunk at approximately  $\frac{2}{3}$  of the height of the tree. When three stakes are required, the tripod method of guying shall be used.

Stakes shall be driven to avoid the ball, and not closer than one foot from the trunk, to a depth which will firmly anchor the tree. The stakes shall extend upward parallel to the trunk to within approximately 4 inches of the lower main branches remaining after pruning has been completed. A uniform height of bracing stake shall be maintained for similar sizes throughout the project. The top of the stake shall be firmly attached to the trunk with No. 11 wire forming a "figure 8" around the stake and trunk. The portion of wire around the tree shall be encased in a hose of sufficient length to contain the wire loop around the tree trunk. Encased trunk loops shall not restrict normal trunk growth. Guy wires shall be twisted so that the trunk is able to move laterally, one to two inches. Each stem of deciduous clumps shall be attached to a support stake.

Where the tripod method of tree guying is used, three No. 11 wires shall be used. One end of each guy wire shall encircle the trunk of deciduous trees just above the lower main branches and of evergreen trees at a point up  $\frac{2}{3}$  of the height of the tree. Hose shall be used to encase the wire encircling the trunk and shall be of a length sufficient to clear the trunk by 6 inches on each end. The other end of each guy wire shall be fastened to stakes equally spaced around the tree and at a distance out from the tree of approximately  $\frac{3}{4}$  the vertical distance from the ground to where the guys are fastened to the trunk. The anchor stakes shall be notched to prevent the wire from slipping and shall be driven at an angle with the tops projecting directly away from the tree and to a depth of not less than 18 inches.

If, during the life of the contract, trees are blown down or are otherwise damaged because of improper bracing or guying, they will be rejected and shall be replaced at the Contractor's expense.

Replacement plants planted at the beginning of the second growing season shall be braced or guyed. Guying and wrapping material shall remain and be maintained until project completion and then removed.

- L. **Period of Establishment.** A period of establishment commencing at the completion of the initial planting and extending through the following two growing seasons will be required for all plants. A growing season is defined as the months of June, July, and August.

All plants shall be in a healthy growing condition at the start of the establishment period.

The Engineer will inspect the plants at the end of the first and second growing seasons to determine if any plants are unacceptable. Unacceptable plants are defined as being dead, missing, unhealthy, or otherwise unsatisfactory at the time of inspection, and plants that were not planted according to these specifications. Dead evergreen plants shall be removed before winter. Replacement plants shall be planted, as specified in subsection 815.03.F, prior to May 10 of the following spring planting season. Replacement plants

planted after the first growing season shall be watered along with the other plants receiving their second season watering. Unacceptable plants identified by the Engineer at the end of the second growing season, shall not be replaced but removed along with all guying materials and disposed of off site. A 50 percent reduction of the bid price, for the respective botanical name, shall be made for each unacceptable plant identified. This amount shall be deducted from the retainage amount, identified in section 109.06, prior to final payment being made.

#### 815.04 Measurement and Payment.

Contract Item (Pay Item)	Pay Unit
Site Preparation .....	Lump Sum
(Botanical Name) .....	Each
Watering and Cultivating, First Season .....	Lump Sum
Watering and Cultivating, Second Season .....	Lump Sum

- A. The work of **Site Preparation** includes digging holes, furnishing prepared soil, backfilling the holes, and disposing of excess excavated material.
- B. Plants will be measured in the units called for on the plans and by the methods specified in ANSI Z 60.1. Payment for the item **(Botanical Name)** will not be made until the plant has been pruned, planted, watered in, wrapped, braced or guyed, and mulched. No additional payment will be made for replacement plants.
- C. Twenty percent of the applicable lump sum price for **Watering and Cultivating, First Season and Second Season** will be paid at the completion of each of the five watering and cultivating operations specified during each of the two growing seasons.

All supplemental watering required, in addition to the 10 watering operations specified, will be authorized at 20 percent of the applicable contract lump sum price. Each watering that is deleted will result in a 20 percent reduction of the applicable contract lump sum price.

**Watering and Cultivating, Second Season** includes furnishing and mixing the fertilizer with the water.